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ORIGINAL COMMUNICATIONS.

CASES WITH HYDROPHOBIC SYMPTOMS.

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AND

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WITH MICROSCOPICAL REPORTS

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Read before the Philadelphia County Medical Society, May 25, 1880.

REPORT OF A CASE BY DR. COLLINS.

ON the 22d of January, 1880, a powerful, muscular, active German widow, a saloon-keeper by occupation, gave me the following history of her case:

After ironing, on the 20th, she felt unusually tired, especially in the right arm and hand, in which she suffered pain enough to disturb her sleep. After resting, however, she became more comfortable on the morning of the 21st. During the afternoon of this day the pains again returned, and increased so that she sent for me somewhat reluctantly. Finding her tongue normal, pulse 84, and skin cool, I prescribed morphia, with a diaphoretic mixture, on the supposition that the case was probably one of muscular rheumatism. After taking this mixture she slept well, and seemed much better. She was not seen on the 23d. I knew of no history of specific disease.

When I called, on the morning of the 24th, she alleged that she was no better, complaining of increased pain in both arms, over the back, and in the intercostal regions. She was somewhat hysterical, and was disposed to laugh and weep alternately. I also noticed slight want of co-ordination in the movements of the right hand, with some hyperæsthesia of its surface. While conversing with her, she spoke of some difficulty in swallowing. Wishing to test this, I offered her a teaspoonful of water, pouring it into her mouth rather quickly from the spoon. To my astonishment, this brought on a terrible spasmodic paroxysm, apparently laryngeal. She became purple in the face, and violent and wild in gesticulation. She also became very much agitated and irritated, reproving me angrily for my haste, and for not giving her warning.

Learning that she had visited the drug-store of Mr. Lawson, who resided opposite to her, I called upon him and expressed the suspicion that his neighbor had hydrophobic symptoms, but said that the link of dog-bite

was wanting in her history. He at once exclaimed that about six weeks before she had been bitten by a little black dog. She had interfered to save her pet poodle from this dog, when the latter snapped her in the hands and fingers. Although warned by Mr. Lawson, she scouted the idea of danger.

Making an examination, I now found on the dorsal surface of the right hand, over the metacarpal bone of the middle finger, a blue cicatrix. On the tip of this finger was also a small cicatrix. They were tender to pressure.

Finding that she was becoming irritable, excitable, apprehensive, and suspicious, I proposed that she be removed to the German Hospital for treatment. To this she consented, and was taken to the hospital, arriving about 1 P.M. I called during the afternoon, and found her violently agitated, suspicious, and dissatisfied. She was determined to go home again, and, finding objection to her wishes caused her violent mental agitation, it was deemed best to allow her to return. She arrived at home about 5.30 P.M., where she was, at first, quieter.

She was ordered pills of opium and camphor, one grain each, which she swallowed without difficulty. She became for a time quite composed. She laughed at my suggestion that the bite on her hand might have something to do with her malady, giving me to understand that she knew all about dogs, and had almost forgotten the incident. Her pulse was 94; temperature 102.4° F. She was seen during the evening by Dr. Ferdinand Gross, who confirmed the diagnosis of hydrophobia. She spent a very restless night, tossing and beating about the bed, complaining of the air caused by shaking the bed-clothes, and exhibiting exalted acuteness of hearing and great watchfulness. She had no headache; her bowels were moved, and micturition was performed without trouble.

Early Sunday morning, the 25th, I found her more calm. Her tongue was heavily coated; she was restless and easily agitated, and was dreadfully disturbed by the sight of water, or by the clinking of the spoon in the glass. She managed with effort, and after much preparation, to swallow a few spoonfuls of milk-punch. She also took an opium pill. Her pulse was 94; temperature 103°; respirations 30. Her bowels were moved again at 8 A.M., and she passed urine freely. During the morning she continued to take opium and camphor, swallowing the pills without much difficulty.

At 3.30 P.M. on the 25th I saw her again, with Dr. Charles K. Mills, who also visited her with me on several subsequent occasions. She was in bed, partially clad, talking rapidly but coherently. She said that her hands and arms felt heavy and numb, the right being worse than the left. The cicatrices, which appeared slightly purple, exhibited some

tenderness. Painting with cantharidal colloid failed to blister thoroughly at these points. She complained of her "rheumatism," still ignoring the idea that the bite had anything to do with her condition. The right side of her face was flushed and a little puffy. She had frequent twitchings of the muscles of the face and mouth, the spasmodic movements being much stronger on the right side than on the left. No spasm of the limbs occurred. The patellar tendon reflex on both sides was almost wanting; it could be just elicited. She frequently shifted her position in bed, and complained of feeling very nervous. She had no headache or spinal pain. Her pulse was 94; temperature, taken in the right axilla, 104°; surface temperature, in the middle of the forehead, 102°. The temperature of the room at the time of these observations was 69° F. The frænum was examined, but without result, for the pustules called "lyssi."

An effort was made to have her take some tea, which she said she would try to drink. She was very fussy and particular about having everything just so before she began. She made her son put the cup containing the tea in the bed before her. About one-half a teaspoonful of the tea was put in a spoon, and this she attempted to swallow. Instantly her head was thrown back violently, as if she were strangling; she gave a strange shriek, and struggled and jumped entirely out of bed. She cried out that she was being smothered. An instant later she quieted down, and said she could not swallow. A few minutes after this she tried to take some milk through a glass tube, but failed, although on making this attempt the spasmodic manifestations were less marked. Ten minutes later she succeeded in taking a few spoonfuls of thick gruel. She still swallowed pills without difficulty. She complained of great thirst and dryness of the throat, and expectorated a thick, sticky, frothy saliva. She expressed a wish for plenty of air, but could not endure a draught. Injections of milk and beef-tea, which had been ordered from the beginning, were continued, and were well retained.

At 10 P.M. on the 25th she still complained of terrible restlessness. She swallowed solids and semi-solids, although with great difficulty, abhorring the sight or even the mention of liquids. Her mouth was very frequently affected with twitchings; she made clutching movements with her fingers, and complained of deadness and weakness of both hands. Both upper extremities were becoming helpless, the right forearm showing the most loss of power. A partial wrist-drop was produced by paresis of the extensor muscles. Her tongue was coated and dry; she expectorated tough, tenacious sputa. The pupils were slightly contracted. Her expression of face was wild, haggard, and suspicious. She imagined that she had a hair on her tongue, and

kept her attendants busy trying to remove it. Her pulse was 120; temperature in the right axilla, 104°; on the forehead, 96°. Hypodermics of sulphate of morphia were administered. At 12.30 P.M. her condition remained about the same.

She was seen again between 9 and 9.30 A.M. on the 26th. She complained of the need of food and drink, but was still unable to swallow liquids, and solids only with great effort. She said that the attempt to swallow smothered her. She was weaker and more anxious; rolled and pitched in bed. Spasmodic movements of the face and hands continued. She was worried dreadfully by the currents of air made in moving the bed-clothing. She complained of a feeling of lassitude and weakness, especially in the hands. In the right hand she had no grasping power. Anæsthesia of the hands and forearms was determined to be present by the æsthesiometer. Irritation of the skin brought out marked reflex response from the hands, to a less extent from the feet. She had vomited several times. Her pulse was 128, weak, and compressible; axillary temperature, 103.2°; temperature of forehead, 95.2°; respirations, 24. She was now given one-thirtieth of a grain of the sulphate of curare hypodermically into the right forearm. Her urine was obtained, and examination of it subsequently by Dr. Mills showed albumen in abundance and a slight trace of sugar. Nutritious enemata were no longer retained.

A curious fact, and worth noting, was that ever since she had been taken sick she had kept her pet dog—of which she was very fond—in the room, and even sometimes in the bed with her.

At 12, noon, on the 26th, the spasms seemed much better. She felt more comfortable, and had eaten some solid food. The curare appeared to have exercised a favorable influence. She was, however, expectorating a pinkish, frothy fluid. Her mind was clear. Her urine was loaded with urates. Her pulse was 120; temperature, 103°. Another hypodermic injection of sulphate of curare was administered.

At 6.30 P.M. she was much weaker; the loss of power had extended to her lower limbs. She was spitting profusely. She refused to have any more hypodermic injections. She imagined that she saw beasts in her room, and that lime was spread on her bed. Her pulse was 144; axillary temperature, 105.5°; temperature of forehead, 100°; respirations 36, jerking. Sulphate of morphia was administered by the rectum.

At 12, midnight, she was still conscious, but very weak. Her face was puffy; her pulse was very irregular; her eyes were staring wide open, the pupils dilated. Muscles of the face were almost constantly twitching spasmodically. Enemata passed from her.

At 3.30 A.M. on the 27th she was still worse. Her pulse was 160; axillary temperature, 106°; respirations, 40. Her eyes still remained open, the pupils widely dilated. The conjunctivæ had become injected. She vomited occasionally a clear, viscid substance.

At 5.25 A.M. her limbs suddenly straightened; her face became horribly convulsed; her hands became clenched and rigid; her body was spasmodically bent backwards. This condition of violent tonic spasm continued for five minutes, when she relaxed—dead.

A post-mortem examination was made forty-eight hours after death, Drs. Mills and Updegrave assisting. We were only afforded the opportunity of examining the brain and spinal cord. Both the cerebral and spinal pia mater were hyperæmic, this condition being most marked at the base of the brain. The upper part of the cord and the medulla oblongata were less consistent than is normal. The only definite naked-eye lesions, however, were a number of bloody points and spots on the floor of the fourth ventricle. Just above the level of the acoustic or medullary stria were three bloody spots in the substance of the floor, one in the centre and one on each side of the median line. The central spot was the least well marked; that to the left was the deepest and largest. Other areas of congestion and extravasation were scattered here and there over the ventricular floor, the most marked, after those just noted, being at the upper limit of the ala cineræ, and just below the locus ceruleus on each side. The specimens obtained were referred to Drs. Mills and Seiler.

Remarks by Dr. Collins.—I have taken the liberty of claiming the attention of the Society to a detailed account of this case, believing that its importance warrants a minute history. The hydrophobic symptoms were certainly well marked. The picture of this case contrasts so strongly with that of a case of tetanus which it was my misfortune to treat during January of this year, that I can hardly believe in the unity of the two affections exemplified by the two patients. The peculiar surroundings and the strong common sense of the patient precluded the idea of simulated hydrophobia. I shall not indulge in any lengthy remarks upon the clinical phenomena presented. It might be worth while to direct special attention to the fact that albumen in abundance and a trace of sugar were found in the urine. Claude Bernard, it is well known, has demonstrated that the secretion of urine and its character can be influenced by irritation of the floor of the fourth ventricle, the

situation of the only tangible lesions found in this case.

The microscopical examination of the specimens obtained was made by Dr. Carl Seiler.

Microscopical Report by Dr. Seiler.—Transverse sections of the spinal cord from the middle of the lumbar, dorsal, and cervical regions were prepared.

Lumbar Region.—An infiltration of cellular elements in the external walls of the blood-vessels was found throughout the section, and was most strongly marked in the anterior and posterior horns, and in the lateral columns near the posterior roots. The lateral columns showed a slight increase in the nuclei in the neuroglia. The ganglionic cells appeared slightly cloudy. The pia mater, especially at the posterior portion of the cord, showed numerous collapsed capillaries filled with dark, granular pigment, probably the remains of old blood coagula.

Dorsal Region of the Cord.—Here the same appearances were observed as in the lumbar region. The infiltration of the outer walls of the vessels was, however, more marked, especially at the roots of the posterior horns. Some of the veins were widely dilated. The pia mater appeared thickened, with its vessels infiltrated, but none of the pigmented capillaries were seen. The roots of the spinal nerves showed an increase in cellular elements.

Cervical Region of the Cord.—The same appearances were again observed in this region, but less marked than in the dorsal region. In addition, the membrane in the anterior fissure was much infiltrated with cellular elements. The change in outer coat of the vessels was most marked in the posterior portion of the cord near the surface. The pia mater was at this portion seen to be filled with collapsed and pigmented capillaries.

Complete transverse sections were also made from the lower and upper half of the medulla oblongata, from the central portion of the pons, and sections from the cerebellum, from the optic chiasm, and from the motor region of the convolutions. The sections from the cerebellum were sufficiently large to include portions of the gray and white matter, and of the corpus dentatum; those from the cerebrum were also large, including the entire depth of the convolutions and the white matter beneath for some distance.

Lower Portion of the Medulla Oblongata.—This region showed the infiltration of the outer walls of the vessels, as well as the increase in the nuclei of the neuroglia, well marked at the posterior portions. Capillaries containing granular pigment were found in the pia mater covering the anterior portion.

Upper Portion of the Medulla Oblongata.—The outer walls of the vessels were very much infiltrated in the ventricular or posterior por-

tion. An increase of nuclei was noticed, as well as a granular and pigmented condition of the ganglionic cells in the vicinity of the centres traversed by the section. In other portions of the medulla the ganglionic cells were normal. Collapsed capillaries, containing granular pigment, were numerous in the pia mater covering the anterior portion of the medulla.

Central Portion of the Pons Varolii.—The same appearances were observed here as in the cord and medulla oblongata. A large clot was seen in one of the larger vessels near the median line of the floor of the fourth ventricle. The centre of this clot appeared very old, and was spindle-shaped, occupying one-third of the calibre of the vessel. It was surrounded by more recently coagulated blood, filling the whole vessel.

Cerebellum.—The changes noticed here were an infiltration of the outer walls of the blood-vessels in and near the corpus dentatum, and in some portion of the membrane covering the cerebellum. Pigmented capillaries were also found.

Cerebrum.—The infiltration of the outer walls of the vessels was very slight. The course of many vessels was marked by blood-pigment, evidently the remains of old extravasations which had been partly absorbed. The pia mater appeared to be normal.

Optic Chiasm.—Here a slight increase of the nuclei in the neuroglia was noticed, and also the infiltration of the walls of the vessels.

In order to make a comparative study, portions of the brain and spinal cord from a case of epilepsy were also placed by Dr. Mills in the hands of Dr. Seiler, who prepared sections that would correspond as closely as possible to those from the hydrophobic case. Attention cannot fail to be attracted by the similarity of the lesions found in the two cases. The sections were also carefully examined by Dr. E. O. Shakespeare. The following is the report of Dr. Seiler:

Cervical Region of the Cord.—Nothing abnormal was found except an increase of the nuclei in the neuroglia.

Medulla Oblongata.—Increase of nuclei in the neuroglia and granular and pigmented ganglionic cells were found.

Pons Varolii.—The blood-vessels were dilated and their outer walls slightly infiltrated with cellular elements. An increase of the nuclei of the neuroglia in and near the ganglionic centres was observed. On the floor of the fourth ventricle, a little to one side of the median line, a widely dilated vessel was seen, filled with freshly coagulated blood and surrounded by an extravasation of blood.

Cerebellum.—The changes noticed here were a considerable amount of infiltration of

the outer walls of the vessels, both in the membranes and the substance of the cerebellum, especially in and near the corpus dentatum.

Frontal Convolutions of the Cerebrum.—The vessels were dilated, but their walls were not infiltrated. An inflammatory infiltration of the brain substance was, however, present around some of the vessels. In the parietal convolutions the same changes were observed.

Occipital Convolutions.—The gray matter was found to be in a state of hyperplastic irritation, while the white matter was sclerosed to a very considerable extent. Some of the blood-vessels also were sclerosed.

REPORT OF A CASE BY DR. MILLS.

On the 18th of November, 1877, about 11.30 p.m., I was called, with my friend Dr. William A. Burns, to see a case that presented hydrophobic symptoms. The patient was a boy, 2½ years old. Six weeks before, it was supposed that he had been slightly bitten by a Spitz dog, which had jumped at him in a playful manner. He had two abrasions, one above and one below the left eye, which might have been produced by the dog's teeth, or might have been bruises received in falling.

The boy's parents first noticed that he was out of sorts on the morning of the 17th, when he was peevish and irritable and showed a great fear of falling on being carried about. The next morning he was again drooping and restless, and when, in the afternoon, an attempt was made to wash him, he became very much excited and terrified. About 6 p.m. he had a slight convulsion, and from that time until seen by Dr. Burns, at 10.30 p.m., he had similar spasmodic attacks every few minutes.

The doctor found the child sitting in his father's lap; his face had a terrified look; the pupils were widely dilated; his pulse was rapid, his skin hot, and respirations frequent. His entire body seemed hyperæsthetic; touching him with the hand brought on a spasm, as did also the current of air produced by opening and shutting the door. He did not complain of pain. The sight of a glass of water brought on a severe spasm, which appeared to involve the muscles of the throat, neck, and arms. On trying to swallow a little water, he was unable to do so, and the effort brought on another severe convulsion. During the hour which elapsed before I saw him with Dr. Burns he had several repetitions of these convulsions. Just after I entered the room he had a slight spasm. He wished a drink, and again made an effort to swallow a little water, but immediately became convulsed. The spasms were of short duration and partook both of a tonic and clonic character. The head and body were suddenly bent backwards, and, at the same time, the muscles of the pharynx, larynx, and chest were apparently spasmodically contracted.

The face, arms, and hands also twitched convulsively, the movement being worse on the left side. The child made a restless spring and his entire body trembled. His face became congested, and its expression was that of great anxiety and alarm. His pulse ranged from 120 to 130.

We directed the maintenance of complete calmness and quiet. Five grains of chloral were mixed with a little water, and the child succeeded in swallowing a portion of this. During two hours he had altogether five paroxysms of spasm, a slight one on giving the chloral and four others. Between twelve and one o'clock his bowels were opened, and he passed his water freely, after which he seemed easier. Between 1 and 2 A.M. another small dose of chloral was administered. Between two and three o'clock, the little patient seeming much better, we concluded to leave him for a few hours, directing, before our departure, ten grains of potassium bromide to be given every two hours in milk. We saw him again at 7 A.M. He had been feverish and excited during the night, but had only had four convulsive seizures. He had succeeded in swallowing a little milk. The whole expression of his face was still one of profound fear. He talked in a rapid, incoherent way to his father.

During the day he was seen by Dr. Burns and myself a number of times, and also by Professor H. C. Wood, who coincided with us in the view that the case was probably one of hydrophobic character.

The spasms recurred at intervals of half an hour or less during the day; the difficulty in swallowing became less; beef-tea, milk, potassium bromide, and chloral were administered. A record of the temperature, pulse, and respiration was kept as follows:

At 10 A.M., the temperature was 104° F., the pulse 130; at 12 M., temperature 103.2°, pulse 128, respirations 21; at 3 P.M., temperature 103°, pulse 160 (?), respirations 33; at 4.30 P.M., temperature 105.3°. He became steadily weaker and weaker. During the afternoon he ejected a viscid discharge from his mouth almost constantly. He died, apparently of exhaustion, about six o'clock.

We could only obtain permission to make a spinal post-mortem examination. The spinal cord and attached membranes and fragments from the deep muscles of the back were placed in the hands of Dr. Carl Seiler for examination.

Dr. Seiler made the following report. Inspection and microscopical examination showed the following conditions: (1) The spinal dura mater was thickened on the left side the whole length of the cord. (2) Sections made from the cord at intervals of one inch showed a general sclerotic thickening of the vessels, with an increase of nuclei in the substance of the cord. In the upper third of the cord the posterior columns were slightly

fatty, oil-globules being found in most of the multipolar ganglionic cells. (3) The muscular fibres taken from the piece of muscle were found to be normal, the striæ being perhaps a little less distinct than is generally found. From all appearances there seems to have been an old inflammation, both in the cord and its membrane, with perhaps an acute inflammatory process imposed upon it.

REMARKS ON THE NATURE OF HYDROPHOBIA
BY DR. MILLS.

The commonly accepted view in regard to hydrophobia in man is that which considers it a disease produced only by the implantation of a specific virus. I believe, however, with Hammond that it is perfectly possible that it may be a nerve disease from the beginning. This is not by any means a new doctrine; it is as old as the age of Democritus, the laughing philosopher, who described hydrophobia as an inflammation of the nerves, and classed it with the severe spasmodic diseases allied to tetanus (Bollinger, "Ziemssen's Cyclopædia," vol. iii. p. 433). I do not, with some, deny the existence of an affection which may for want of a better term be called hydrophobia; that a horrible spasmodic disorder sometimes follows the bite of a dog cannot be doubted, but that it is a specific blood disease may well be questioned. The arguments in favor of this hypothesis are, to say the least, not convincing, and against it can be urged many facts, etiological, clinical, and pathological.

The cases called hydrophobia probably represent several different affections. Certain acute or chronic diseases of the brain and spinal cord, or their envelopes, may, for instance, give rise to similar spasmodic and other symptoms. I need only mention localized meningitis, and tubercular, syphilitic, or other growths upon the floor of the fourth ventricle. Increased reflex excitability and spasm of the muscles of respiration and deglutition, the most constant symptoms in reported cases of hydrophobia, may be caused by any affection which acts directly or indirectly as an irritant to certain areas of the medulla oblongata and pons Varolii. Epilepsy, tetanus, and hysteria have, it is well known, not infrequently been supposed to be hydrophobia. Leaving out the cases of mistaken diagnosis, I incline to look upon the hydrophobic cases in man as primary affections of the nervous system, as probably belonging to what are termed

reflex neuroses. Just as in traumatic tetanus and reflex epilepsy, so in so-called hydrophobia, the irritation caused by a peripheral nerve wound is conveyed by afferent fibres to spinal and medullary centres, and there induces molecular and vascular changes, which lead to the well-known spasmodic and other manifestations. As the time at the disposal of the Society is limited, I will not be able to go into much detail in the consideration of this subject. I trust, however, that I may at least succeed in eliciting a discussion that will bring out the opinions and valuable experience of those present.

The bites of dogs supposed to be rabid often do not produce hydrophobic symptoms, and it seems probable that the same causes which act or fail to act in the production of tetanus are at work in these cases rather than that inoculation is prevented by accident or individual predisposition.

Many facts are on record to show that the bites of animals not rabid may produce hydrophobic symptoms. In neither of the cases reported this evening was the dog supposed to be mad.

Wounds upon the face are known to be much more likely to lead to hydrophobia than those upon other portions of the body. This, I believe, is not simply because the face is the least protected region. Supposing the peripheral nerve-irritation theory to be the correct view, it can easily be seen how a strong impression, carried by afferent fibres to the trigeminal nucleus, will set up there a state of vascular and molecular irritability, which will be quickly radiated to the adjoining nuclei of the glosso-pharyngeal, pneumogastric, and other cranial nerves concerned in the special manifestations of hydrophobia.

The physiological experiments of Hertwig are usually considered as strongly favoring the doctrine of a blood poison, and yet out of fifty-nine attempts at inoculation he obtained only fourteen positive results. Might not these have been due as much to the wounds inflicted as to the introduction of a peculiar virus into the blood?

Any one who has studied carefully the reports of cases of hydrophobia must have been struck with the great differences in the symptoms detailed. Most of the textbooks state that in hydrophobia the spasms are clonic while in tetanus they are tonic,

and yet in the reports in cases supposed to be hydrophobic we find not infrequent references to various forms of tonic spasm. Quite recently, for instance, I read in the *Lancet* the account of a case in which every link in the chain of events which leads to the diagnosis of hydrophobia was present. The patient had been bitten by a dog, probably rabid, seven weeks before the appearance of the earliest symptoms, which were restlessness and difficulty in swallowing. Spasms, severe and tetanic in character, set in, trismus and extreme opisthotonos being present. Recovery took place under the use of inhalations of chloroform and hypodermic injections of calabar bean and morphia. I refer to this case particularly because it serves to illustrate a point which I wish to make, namely, that the symptoms in the disease properly called hydrophobia—that is, a spasmodic affection following the bite of an animal, usually a dog—are not always typical. Between hydrophobia, true tetanus, and reflex epilepsy the differences in the spasmodic symptoms are in degree rather than in kind.

Rose, who strongly argues against the identity of hydrophobia and tetanus, nevertheless describes a form of tetanus which in a more advanced stage presents a perfect picture of hydrophobia, the tetanus of the head or *tetanus hydrophobicus*. If in a spasmodic affection undoubtedly due to a wound other than the bite of an animal we get typical hydrophobic symptoms, it is far from absurd to suppose that hydrophobia frequently is the direct or indirect result of peripheral nerve-irritation.

A favorite procedure, and one that has seemed in many cases to do good, is cauterization at the seat of the bite. Caustic potash, nitric acid, the actual cautery, burning with gunpowder, excision of the wound or cicatrix, and amputation of the wounded part are among the measures of local treatment frequently employed. The general supposition seems to be that by these destruction of the virus is brought about. Is it likely that this is the case? I believe that these plans of treatment, which I am far from discountenancing, are more probably efficacious from the effect which they produce upon peripheral nerve-tissue.

Pathological anatomy has not done much as yet to clear up the mystery of hydrophobia. I certainly agree with Bollinger

that the morbid changes which have been found in the human subject are of an unsatisfactory character. Meynert, Allbutt, Lockhart, Clarke, Hammond, and a few others have reported the results both of gross and microscopical investigation, but without arriving at anything very determinate. In most respects their observations upon the central nervous system correspond with those made by Drs. Collins, Seiler, and myself in the case just reported. Changes such as the following have been noted by these observers: thickening of the walls of the blood-vessels and increase in their size and number; extravasations of blood, particularly into the pons and medulla oblongata; amyloid degeneration and nuclear proliferation of the cells of the neuroglia; and granular degeneration of nerve-cells. Like changes have been found in other cerebro-spinal affections. We have shown this evening analogous conditions in specimens from epileptics.

The microscopical examination, both in the hydrophobic and epileptic cases just reported, seemed to show that both the central nervous organs and their blood-vessels had been for a long time in an unhealthy condition. This fact affords an explanation of many cases of so-called hydrophobia. The central nervous system is in a chronic state of disease from syphilis, alcohol, or other cause, and as an accidental coincidence, or as the direct result of the peripheral irritation set up by a dog-bite, we have spasm and other hydrophobic manifestations. In the case seen by Dr. Burns and myself, post-mortem investigation revealed thickening of the spinal dura mater as well as sclerotic and fatty degeneration.

The lesions found in the floor of the fourth ventricle in both the hydrophobic and epileptic cases reported this evening are worthy of more detailed consideration than can at present be given to them. Schroeder van der Kolk, Echeverria, and others have called attention to the congested foci, dilated capillaries, and extravasations found in the pons and medulla oblongata in epilepsy. In several cases of fatal convulsive disease, I have noted particularly the position of congested and hemorrhagic areas. The most constant of these are situated a few lines above the acoustic or medullary striæ. Usually at this level will be found a bloody spot on each side of the median line, while in the

median line will be seen a less intense focus of congestion. Other vascular points and spots, sometimes duplicate or triplicate and sometimes isolated, are scattered here and there. Some are in direct relation with the nuclei of certain cranial nerves. It is not improbable that some of them indicate the position of great basal centres, vasomotor, respiratory, reflex, etc., the exact position of which physiologists have long and vainly sought to determine.

NOTE ON BISMUTH SUBNITRATE.

BY HENRY LEFFMANN, M.D.

Read before the Philadelphia County Medical Society, June 9, 1880.

RECENTLY I had occasion to examine the stomach of a woman supposed to have died from poison, and who had taken during her last illness several doses of bismuth subnitrate. A quantity of it remained in the stomach, and, upon making a microscopical examination, I was much surprised to find the entire mass made up of well-defined crystals. I had never studied the physical condition of this remedy, but had always taken for granted that such an insoluble substance would be used only in the form of an impalpable or, at least, amorphous powder. Its method of preparation and irregularity of composition would also be in favor of this view. A similar opinion was entertained by several physicians and pharmacists of my acquaintance. Most of the books either leave the physical condition undescribed or speak of it as pulverulent. Taylor (*On Poisons*) especially calls it "uncrystalline." The United States Dispensatory speaks of it as being in "minute crystalline scales," which hardly describes the condition.

To pursue the matter, I obtained samples from various places, and discovered that one of the large manufacturing firms in the city furnishes regularly a crystalline preparation, another firm furnishes an amorphous powder. The crystals vary somewhat in size, but those of the most abundant variety are about $\frac{1}{100}$ of an inch long and $\frac{1}{1000}$ of an inch wide. I consider this observation of some importance, in view of the fact that the solution and absorption of such powders must be greatly facilitated by fine division; and even if we adhere to the view that bismuth sub-

nitrate acts mechanically by spreading over the mucous membrane, it would seem that a smooth and impalpable powder would answer best.

In this connection it may not be amiss to remark that, from experiments made in the course of another investigation, I have found that the homœopathic triturations of arsenic bring that medicine to a mechanical condition in which it is much more easily mixable with liquids than when in its ordinary state.

I have brought with me this evening this specimen, which is a portion of the bismuth subnitrate found in the stomach. You will notice that the finer particles have been dissolved or washed away, and that we have a coarse crystalline powder. The dark color is, in all probability, due to the formation of bismuth sulphide from the gases of decomposition.

I display, also, by means of microscopes, two slides, bearing, respectively, crystalline commercial subnitrate, amorphous commercial subnitrate. I have made a number of experiments with a view of ascertaining the chemical conditions under which the two forms of the precipitate are produced, but have not yet reached any definite result.

DERMOID TUMORS OF THE CORNEA.

*Read before the Philadelphia County Medical Society,
June 9, 1880,*

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THE specimens of dermoid tumor of the eyeball which I show this evening are interesting, I think, because they are infrequently seen even by the ophthalmic surgeon. Hence I have ventured to present them for the consideration of the Society, even though these eyes formerly belonged to one of the lower animals. The pathology of such growths is the same, of course, in the human subject, but it is seldom that such good examples are seen in any form of animal. I know nothing of the specimens, except that the eyes were removed from a young bullock in one of the slaughtering establishments of this city, and were preserved because of their peculiarity.

It will be seen that each cornea is partially covered by a circular, somewhat ele-

vated growth, closely studded with reddish hairs such as are seen upon the surface of the animal. The hair is perhaps three-eighths of an inch long. In one eye the tumor involves the sclerotic region and then invades about one-third of the cornea, while in the other eye the growth seems to be limited almost exclusively to the corneal tissue, leaving only about one-fourth of its surface free from involvement. The tumors are about the size of a ten cent-piece, and in one the continuity of the conjunctiva of the sclerotic with the surface of the tumor is easily seen.

It is well known that the conjunctiva is a mucous membrane, and that its epithelial layer is continued over the cornea. This explains the occasional occurrence of dermoid tumors upon the cornea, and the fact that usually they encroach upon the cornea from the conjunctiva covering the sclerotic. As the mucous membrane is histologically similar to cutaneous tissue, it is not surprising that hair should be developed upon the eyeball. In some of the lower quadrupeds the skin of the face is, I believe, continued over the eyeball, and is supplied with hair. This is a further illustration of the same principle.

Dermoid tumors of the cornea in man are usually congenital, as these in the calf doubtless were, and are more prone to extend from the conjunctiva and sclerotic to the surface of the cornea than to be limited to the cornea itself. There is usually little hair upon them, but they contain the same histological elements as skin. A case is recorded* where hair appeared at the time of puberty, when the boy's beard began to grow. These tumors are seldom rapid in growth, and may remain almost the same for years. They are, of course, non-malignant. Dr. Risley has recently reported† an instance of a somewhat similar dermoid tumor of the eyeball to the Pathological Society of this city, and other cases are, I think, recorded in the "Transactions" of that body. In a recent journal‡ an article appeared, descriptive of a case of development of hair on the eyeball of a dog. The hair invaded the margin of the cornea and extended to the outer canthus. This was doubtless a growth of this kind.

The treatment of such cases in the human

* Wardrop's Morbid Anatomy of the Human Eye, i. 32; quoted by Wells.

† Philadelphia Medical Times, June 19, 1880, p. 490.

‡ Journal of Anatomy and Physiology, xiv., i. 143; from London Medical Record.

subject may be mentioned. The amount of blindness depends, as is readily appreciated, upon the extent of cornea involved. Hence in some cases the impairment of vision may be so great as to necessitate an attempt at removal. If the growth is superficial, it may be pared off as we do in pterygium, which is a somewhat analogous structure. The cornea is frequently, however, involved to a considerable depth, and the anterior chamber may be opened in the attempt. In such cases, moreover, operation will be of little value, even if there remain sufficient corneal tissue to prevent perforation, because corneal opacity will remain at the cicatrix.

ADYNAMIC PNEUMONIA.

BY E. T. BLACKWELL, M.D.

DURING my earlier practice I saw considerable pneumonia answering to the classical description, and characterized by a full, strong pulse and bright-red sputa, that easily gave way to depressing remedies, notably quinia and blisters. The latter, when early applied, while the powers of life had good resistance, seemed to exert a controlling influence. Especially was this manifest in the catarrhal form affecting young children.

The pneumonia, however, which most claims our attention exhibits from its beginning not vigor, but great weakness and tendency to prostration. The patient lies upon his back. The pulse is rapid, while the surface may be bathed in perspiration. The sputa, the mucous membranes, and the skin are dark-colored. There is great restlessness and speedy loss of strength. This is typhoid pneumonia, or pneumonia with hypostasis, and the treatment useful in the sthenic variety is worthless, if not absolutely pernicious. The pulse rises instead of falling; the difficulty of breathing is exaggerated instead of being lessened; and the powers of life quickly fail. I subjoin a few illustrative cases:

Mrs. S., aged about 50, of a delicate constitution, was taken, January 31, 1875, with chilliness and pain in the side, a high fever following. I saw her at 9 o'clock A.M., February 1. She had slept none during the night, and was lying upon the back, profusely perspiring. Her breathing was very quick and shallow, and she was expectorating a bloody mucus. The bowels were shut; pulse

A blister was immediately applied to the whole of the affected part, and the following medicines ordered:

R Hydrarg. chl. mit., gr. iii;
Sodii bicarb.,
Quiniae s., aa gr. xii.

Mix, and divide into eight powders, one to be taken every three hours.

R Potassii citratis, ʒj;
Ex. aconiti fl.,
Ex. digitalis fl., aa gtt. xii;
Sp. ætheris n.,
Aq., aa ʒvi.

Mix. A teaspoonful to be given alternately with the powders.

Morphia was prescribed for the restlessness and to procure sleep.

February 2 I was sent for in haste, arriving at 10 A.M. The breathing had not improved; the tongue was dry; the bowels still closed; the urine hot and red; the skin moist; the voice whispering; the pulse quick and weak; the respiration bronchial; and every movement was attended with exquisite pain. As the epispastic had failed to produce a sufficient blister, the surface was painted with cantharidal collodion.

7 o'clock P.M. The patient had dozed some, and seemed to breathe easier; the urine was freer, and there had been an evacuation by the bowels. Medicine to be continued as before. On the morning of February 3, the fourth day of the disease, collapse occurred, and she died.

W. R. R., a farmer, about 40 years of age, was taken, March 28, 1875, with chills, alternating with fever and free epistaxis. When I saw him, the day following, he had "a catch" in the left hypochondrium, cough, and expectoration of mucus, with some blood. The pulse-rate was 110; the skin moist, but red and congested; the soft palate, also, presenting a punctate redness. The bowels were moving freely. No false sounds could be detected over the affected part. The same medicines were ordered as in the preceding case, except the calomel, and domestic applications were made to the chest. The next day he was coughing up a rusty mucus, was sweating profusely, his headache continuing; pulse unchanged. The chest was still resonant, and he was careful to show me that he could fully inflate his lungs. Belladonna was added to the medicine to check the sweating. In the night he became delirious and very restless, complaining of his bowels and head. I was summoned, arriving at 1 A.M. of April 1. His pulse was unchanged, and he was drenched with perspiration. The iodide of potassium was substituted for the citrate, and paregoric elixir added. At 5 P.M. there was less perspiration, the pulse was 105, and epistaxis had recurred. April 2, the tongue was cleaning; pulse 102. 3d, had had fever during the night, succeeded by free sweating; was very restless, needing morphine; his

urine was loaded with straw-colored precipitate; the tongue was moist, but heavily coated, except at the tip; the bowels were tender and tympanitic; the pulse 111, and rather weak. He still raised stained mucus, and auscultation revealed some blowing respiration in the posterior part of the chest, but no râles.

Iodine, dissolved in cantharidal collodion, was now applied to the chest, which was enveloped in oiled silk. Yolk of egg, wine, and milk were ordered. At 7 P.M. of same day the patient was delirious, with a pulse at 125. He was in a gentle perspiration. A consultation was now arranged for, to take place the day following, but the patient continued to fail, dying on the ninth day of the disease.

I took charge of the following case August 2, 1871, receiving the following history *verbatim*:

E. P., farmer, aged 34, took a cold, about the preceding holidays, while moving a stone fence, having towards spring what was called whooping-cough, attended by a foul corruption, lasting till the beginning of May. He raised, especially after breakfast, "a swill-pailful." Frequently threw up his breakfast, coughing till he became red in the face. His immediate sickness dates from July 24, commencing with an agony in the loins and hips and a pain in the head, accompanied apparently by congestion, as he says he knew but little. These symptoms, in less severity, with a morning and evening paroxysm of fever, prevailed until the date of my visit, which was during an interval, the pulse marking 78. The tongue had a thick, creamy coating, and he had a cough, with mucoid sputa. His urine was nearly thick; his bowels had been costive throughout, but he had taken "salts" twice, with a hypercathartic effect. On physical exploration of chest, there was found dulness of percussion in the right lung, anteriorly and posteriorly, with prolonged expiration and increased vocal vibration at apex; on the left side there was dulness in front only. He was ordered a pill composed as follows:

R Quinæ s.,
Cinchonæ s., aa ʒj;
Acid. s. arom., q. s.

Mix, and divide into ten pills, one to be taken every four hours alternately with a mixture having expectorant, diuretic, and anodyne properties. The day following the pulse was as before, the tongue appearing cleaner. A pain was complained of about the left ear. August 4 a subcrepitant râle was heard in the lower part of the right lung, with large bubbling. The cough was tight, and the expectoration streaked with blood. The tongue was cleaner. The quinine was continued as before, and iodide of potash added to the mixture; gentian as a tonic. On August 5 the pulse was 96. A blister was applied to the chest as a counter-irritant. From this

time till the 10th the pulse gradually arose, notwithstanding the constant saturation of the system with quinine; the cough was tighter, and the breathing quicker and shallower. On the 11th the tongue was chapped, and the whole pharynx covered with aphthous-looking exudation on a purplish ground. There had been high fever the preceding night, with much headache. He was urinating freely. The pulse was 107. August 12 the pulse had reached 120; respiration much interfered with. Compound spirit of sulphuric ether and carbonate of ammonia exhibited. The pulse continued to rise, ranging, on the 13th and 14th, from 130 to 150, and the tongue was marked by a dark stripe. Subsultus followed, and death on the 15th,—the fourteenth day of treatment and the twenty-fifth of the disease.

A review of the symptoms of the foregoing cases shows many which coincide with those of the infectious fevers, e.g., the agony in the head and loins, the lividity of surface, the looseness of bowels, and the epistaxis; and I have been led to think well of the idea of Juergensen,* formulated in this question to himself: "Are the pulmonary lesions and the fever due to a common cause?" His reply, on a succeeding page, is clear and unequivocal: "*Croupous pneumonia is a constitutional disease, and is not dependent on a local cause. The pulmonary inflammation is merely the chief symptom, and the morbid phenomena are not due to the local affection. . . . Croupous pneumonia belongs to the group of infectious diseases.*" He observes further, "When we realize that we have to combat, not an 'inflammation,' but rather a constitutional disease, and one, moreover, of comparatively short duration, we readily fall into an expectant treatment, which bides its time, interferes only when necessity requires, and does not see in the mere name of the disease an indication for attack. If we are chiefly occupied with the idea of a 'phlogosis,' we must necessarily associate with it 'the antiphlogistic treatment.'"

This being his judgment of the nature of the malady, he says, "*Nature cures, and the only duty of the physician is to maintain life until the cure is effected.*"

The morbid phenomena, according to this author, are: "1st. An interference with the functions of the lungs. 2d. Fever. Neither of which conditions is fatal by itself. . . . *Death results from*

* Art. Croupous Pneumonia, Ziemssen's Cyclop., p. 143.

insufficiency of the heart. . . . It is the heart, and always the heart, upon which the burden is ultimately thrown." He would meet the indications by—"1st. Prophylaxis against exhaustion of the heart. 2d. Control of existing exhaustion. The fever is the first point of attack for treatment." With this, he says, "in the present condition of our knowledge, the prophylaxis against exhaustion of the heart coincides essentially."

He would reduce it by baths of from seven to twenty-five minutes' duration, of a well-water temperature, guarding against collapse and securing proper reaction by administering wine before and after the bath. In the enfeebled he would gauge the temperature of the bath at 78°, and its duration from twenty to thirty minutes. Further he says, "There are cases of pneumonia in which the violence of the fever, as shown not merely by the absolute height of the temperatures, but also by the resistance to the abstraction of heat, can be broken only by the most energetic and rapidly-repeated efforts to lower the temperature," detailing a case in which he used baths of 43° to 41° F., and of a duration of ten minutes, repeating the injunction as to the conjoined stimulant. "In addition to the direct abstraction of heat," he adds, "I always use quinine." The assuaging of pain, the production of sleep, a plentiful nutriment, and the genial effects of light are also insisted on.

This is the treatment of Juergensen, in the main. Whether we shall accept it, and can carry it out in remote places, time must determine. It is evident our author has no experience with asthenic pneumonia, as he says, "The pulse falls at the same time with the temperature, but remains full and strong, or is improved in character if it had been previously weak." This coincides with my observations of the action of quinine in the epidemic of typhoid fever occurring in my practice in the summer and autumn of 1862.* Under its use the pulse fell daily, remaining full and of good strength.

But *these were sthenic cases*. In asthenia the result is directly opposite, as proved by the cases now reported. Judging by the effects I have seen follow the taking of a dozen grains of quinine in a person not considered enfeebled, I should not be

surprised to see death follow the administration of a single dose as recommended by this author,—sixty to eighty-seven grains. I am positive that perseverance in large doses of this drug, when the pulse quickens under its use, hastens collapse by its intense depressing power. In addition to the cases under my own care, I have recently seen an instance, as consultant, in which the quinine was a contributing element in the final catastrophe.

The doses of chloral (seventy-seven to one hundred and twenty grains), notwithstanding its acidulation by "diluted hydrochloric acid, in order to prevent a decomposition of the chloral hydrate," and with the addition of a cardiac stimulant, seem altogether too hazardous. Having seen very good results from this drug in doses of one to five grains, often repeated, I am well content to leave these heroic measures to our brethren across the water.

TRANSLATIONS.

THE OCCURRENCE OF TAILS IN MAN.—Professor Virchow (*Virchow's Archiv*, Bd. 79, p. 176), in a brief article on this subject, refers to several cases which have been reported by recent or older writers. Dr. Ornstein, of Athens, surgeon-in-chief of the Greek army, has recently reported several instances of abnormal growth of hair in the sacral region, which Virchow designates as "sacral trichosis." Ornstein's view was that these growths were atavic in character, and were analogous to the hairy tails of inferior animals. Virchow, having met with a case of partial lumbar trichosis, investigated the matter, and came to the conclusion that two similar but distinct conditions may exist,—either a simple growth of hair or a hairless prolongation from the coccyx of a cutaneous nature. Virchow's case appeared, on examination, to be an unusual form of *nævus pilosus*, situated over the closed spina bifida of an adult woman, and evidently to be explained by the supposition of early local irritation. But, on the other hand, medical literature certainly affords a certain number of examples of true tail-formation in man, this appendage apparently resulting from elongation of the vertebral column. None of these cases, however, were complicated by the abnormal growth of hair. One of Ornstein's cases showed a distinct elonga-

* N. J. Med. Soc. Transac., 1863.

tion five centimetres in length. It appeared to originate in the attachment between the first and second false vertebræ of the coccyx. The process itself was hairless, but a decided collection of hair appeared over the sacral region.

Michel has pointed out that in the human embryo a rudimentary tail is distinctly made; and the discovery of men with tails seems to lend support to Lord Monboddo's theory that all mankind originally wore them. Virchow remarks upon the frequent occurrence of a considerable quantity of hair upon the sacral region of new-born children.

One of the longest tails on record is that reported by Greve in 1878 (*Virchow's Archiv*, Bd. 72, p. 129). This occurred in the case of a new-born infant, was 7.5 centimetres in length, and moved about when pricked with a needle. It was removed by an operation. Virchow recently dissected this tail, and found it not to contain any bone, cartilage, or muscle; nevertheless, it was a good substitute for a tail.

The custom among certain savage nations of attaching artificial tails to the person has been regarded by some anthropologists as a reminiscence of the happier times of tailed ancestors. Virchow, however, throws some doubt on this.

PYROGALLIC ACID IN PSORIASIS.—Dr. Charrassé (*Bull. Gén. de Thérap.*; from *Montpellier Méd.*, May, 1880, p. 416) gives the results obtained in the hospitals of Montpellier by the topical treatment of psoriasis by pyrogallic acid, which are as follows:

The best ointment is that containing five to fifteen per cent. of pyrogallic acid (3i-3iv ad 3j). It is the best known application in psoriasis, reducing the duration of treatment to an average of three or four weeks. The ointment should not be made stronger than twenty per cent. (3iiss ad 3i); otherwise its application is apt to give rise to erythema, or even dermatitis or ulceration. One to four frictions daily should be practised. Pyrogallic acid is better borne than other agents, and has the advantage of not causing pain and of being inodorous.

Pyrogallic acid is no more a cure for psoriasis than other topical remedies: that is to say, it does not prevent relapses; it only cures the external manifestations of the disease. For this reason it should be associated with internal medicines, as arsenic, in order to get the best results.

Nevertheless, frictions of pyrogallic acid will sometimes alone suffice to cure psoriasis.

There does not appear to be any precise indication for its employment; it is useful and gives good results in all stages of the affection, and in every variety. The observations of Kaposi, Jarisch, Arragon, and Bruyère confirm Charrassé's statement on this point. Aubert, of Lyons, thinks that the frictions should not extend over too large a surface (death has, we think, been reported as the result of too extensive inunctions of pyrogallic acid.—*TRANS.*).

The principal objection to the employment of pyrogallic acid is the brown color which it gives to the integument; but this coloration is not constant nor everywhere well marked, and it disappears after some days.

TREATMENT IN CASES OF INTRA-PERITONEAL RUPTURE OF HYDATID CYSTS.—

At a recent meeting of the Académie de Médecine (*Le Progrès Méd.*, 1880, p. 426) M. Fereol read a paper on this subject, in which he states that in the present condition of our knowledge it is impossible to say exactly what circumstances determine the comparative mildness or malignity of the symptoms which accompany rupture of hydatid cysts into the peritoneal cavity. The following conclusions, however, may be stated with some degree of confidence:

1. Previous suppuration of the cyst gives rise in case of rupture to a subacute, rapidly fatal peritonitis, at least where the peritoneum has not been sealed by adhesions which limit its inflammation.
2. The penetration into the peritoneum of an absolutely limpid and clear fluid, which appears to be inoffensive in some cases, is followed in other cases by rapidly-fatal accidents.
3. The presence of living hydatids thrown into the peritoneum is less dangerous than that of dead hydatids: spontaneous cure is possible in the former case.
4. In cases where the peritonitis following rupture becomes moderated, and where, nevertheless, ascites is produced, intervention may be practised with some hope of success if this ascites is not absorbed. Simple puncture is alone sufficient to effect a cure. If this procedure fails, it may become necessary to evacuate the foreign bodies contained in the peritoneum as soon as possible. A large opening may be made into the abdomen by a trocar, and cleansing out of the peritoneal cavity twice daily may be employed with success.

PHILADELPHIA MEDICAL TIMES.

PHILADELPHIA, JULY 31, 1880.

EDITORIAL.

EDUCATIONAL REFORM.

IF the institutions which form the American Medical College Association are true to their promises in the recent convention, the latter will mark the successful crisis of a revolution in medical education upon this continent. Last year Professor Menees offered an amendment to the constitution of the Association, requiring all colleges which are members of the body to demand attendance upon three annual courses of lectures before granting their diploma. On consideration of this amendment at the late meeting, Professor Gross, under instructions from the college which he represented, opposed it. Nevertheless, after full discussion, it was carried, Professor Gross's being the only dissenting voice. Twenty colleges were represented in the affirmative vote, as follows:

Medical Department of University of Louisville; Hospital College of Medicine; Medical Department Iowa State University; Detroit Medical College; Medical Department University Nashville and Vanderbilt; Missouri Medical College; Kansas City College Physicians and Surgeons; Louisville Medical College; Medical Department Michigan University; Medical Department University Louisiana; Alabama Medical College; Medical College State of South Carolina; Medical College of Indiana; Cincinnati College of Medicine and Surgery; Cleveland Medical College; Nashville Medical College; St. Joseph Hospital Medical College; Chicago Medical College; Medical Department University Wooster; Kentucky School of Medicine,—20.

This change of the constitution becomes effective next year, so that after the coming winter every college which belongs to the Association must require attendance on a three-years course.

We confess to as much surprise as pleasure at the result thus achieved. It will be noticed that almost every college voting in the affirmative is a Western or Southern institution, whilst, to our shame, the oppo-

sition came solely from one of our great Eastern cities.

The College of Physicians and Surgeons of New York and the Bellevue Medical College had no representatives present in the convention, having withdrawn from the Association. Rush Medical College of Chicago, also, is not a member of the Association, and, we fear, will adhere to the old disgrace, because it still pays. It can hardly be possible that the signing institutions did not fully comprehend what they were doing when they entered into the recent compact. During a full year the matter had been staring them in the face, warning them to prepare for an inevitable vote one way or the other, and without doubt the faculties fully realized the situation: the decision must be accepted by outsiders as a deliberate one, not to be departed from without entire loss of character.

Five years ago educational reform in medicine seemed, upon this continent, a chimera. When, in 1875, the attack upon the system was made in *Lippincott's Magazine* by the present editor of this journal, the case seemed so hopeless that some of the most prominent and progressive trustees of the University of Pennsylvania, upon being shown the proof of the article, urgently requested that it be withdrawn from publication, because the times were not yet ripe. The bitter contest in the University between the young and progressive and the old and conservative elements was at last brought to a successful issue, and gave a tremendous impulse to the reform movement throughout the continent. Now the great majority of the medical colleges of the land have joined hands in the new life. There still remains a group of very powerful institutions,—Rush Medical College, in Chicago; the College of Physicians and Surgeons of New York; the New York University; and the Jefferson Medical College, in this city; and the question of the hour is,

Will these persist in defying the rising tide of medical public opinion in maintaining a standard of medical education so far below that required in any civilized country other than the United States?

These institutions must conform to the higher standard, or sink out of sight in the reprobation of their own alumni. If they continue in their present course, the immediate effect upon them of the conscientious action of the associated colleges must, of course, be favorable,—at least, so far as concerns the size of their classes. There are, undoubtedly, large numbers of young men in this country who are only eager to get the right to practise medicine at the least possible cost of money, time, and labor. Squeezed out of the smaller colleges throughout the West, they will crowd into those institutions which still receive them. But can any man—will any man not connected with these colleges call gains thus acquired honorable? Will it add lustre even to a humble name to be a professor in such an institution? Can, indeed, any man who values his professional standing afford such connection?

Possibly some members of present faculties may think it wise to maintain the present status;

"For the jingling of the guinea heals the hurt that honor feels,"

and *après nous le déluge*. Assuredly, however, it will not pay the colleges to remain as they now are. Medical public opinion is too thoroughly formed and too loudly expressed even for an attempt at justification of the course which, there is reason to fear, will be persisted in by some, at least, of these institutions. For a time pecuniary success may attend, but the delayed recompense will come. Through many decades these great Eastern schools have been abreast of their sister institutions, forward among the medical centres of the land, and have thereby acquired a deserved reputation, which gives value to their diplomas, as well as position and

fame to their faculties. It is this which brings so many to their class-rooms. To get a highly-reputable diploma, cheap, dirt-cheap, is in the eyes of many of the young and inexperienced a good thing. At first crowds may flock to the lectures; but what will the after-harvest be? No man, who had been well nurtured and honorable, ever sold a character acquired through long decades at so high a price that the years did not bring the time when he felt that his reward had been a pottage of bitter herbs. In the present case the price offered is but little more than thirty pieces of silver!

As the changes made in the constitution of the associated colleges do not go into effect until next year, there is time for the outstanding institutions to do what is right; and we most earnestly urge upon their faculties, their trustees, and especially upon their alumni, the need of prompt action in the present crisis. Medical schools live in the good will of their alumni; and if those men who do not want to see their old *alma matres* disgraced and their own diplomas made laughing-stocks will exert actively and persistently their influence, the colleges must give way. The power of one alumnus may not be very great, but the converging efforts must produce a focus capable of consuming the dross in any faculty or board of trustees.

HARVARD MEDICAL SCHOOL.

In the Harvard catalogue is a paragraph which, as pointed out by Professors N. S. Davis and S. D. Gross in their report to the American Medical College Association, indicates that the institution which has done so much for medical education now graduates men upon *one year's attendance* on medical lectures! The inference of Professors Davis and Gross seems a fair one, and we call upon Harvard to explain. We make the following extract from the report:

"The language of their catalogue for 1879-80 touching this

point is, under the head of *Division of Studies*, as follows: 'Students may be admitted to advanced standing in the regular course; but all who apply for admission into the second or third class must pass an examination at the beginning of the year in the branches already pursued by the class to which they seek admission, and furnish a satisfactory certificate of time spent in medical studies.' Again, under the head of *Requirements for a Degree*, we are told that 'Every candidate must be twenty-one years of age, and of good moral character; must give evidence of having studied medicine three full years; have spent at least one continuous year at this school; have presented a satisfactory thesis; and have passed the required examinations.'

"In turning to the examinations required in each year, we find those of the first year to be Anatomy, Physiology, and General Chemistry; those for the second year, Medical Chemistry, *Materia Medica*, and Pathological Anatomy. Now, it strikes us that he must be rather a dull young man who cannot take the necessary books, get some regular practitioner to lend the use of his name as preceptor, and in two years make himself sufficiently familiar with the language of his text-books that he can pass a fair examination, either oral or written, in Anatomy, Physiology, and General Chemistry, in connection with at least two out of the following three: Medical Chemistry, *Materia Medica*, and Pathological Anatomy. And if he can do this, he can step directly into the third or graduating class, and complete his course by attending *one* college year, without ever having set foot inside of any other medical school."

LEADING ARTICLES.

MEDICAL EDUCATION IN JAPAN.

A LITTLE upwards of two decades of years since there was an eccentric teacher in Kiushiu. He was ugly and was disfigured by smallpox; his personal habits were sluttish; his clothes were wretched; his rooms were always in disorder. He was a good teacher, gentle in act, though often abusive and violent in his speech, and his lessons too often went over the heads of his students. He was weak of body from long confinement and hardships, but his mind was active, his instruction advanced, and his thoughts devoted to the elevation and advancement of his countrymen. As a young man, he had wandered far in his native land to study her miseries and to ascertain a remedy; as a *Lamurai* and a military engineer, he felt that the manners of the overriding barbarians and the visits of their huge steam-vessels was an increasing menace to his beleaguered country; as a patriot, he had it upon him to keep out these all-powerful foreigners. By envying them their military strength, he soon came to envying them their culture. The power and the knowledge of these foreigners were inseparable. He was soon engaged in the composition of a book advocating a new

system of defences for Kioto and the establishment in the same city (that of the Mikado, or spiritual emperor of that period) of a university of foreign teachers. He hoped to get the good of other lands without their evil.

He was then twenty-two years of age. He obtained permission to become a *Rouin*,—a soldier of fortune. He walked to Yeddo, ostensibly to obtain military employment, but in reality to *steal away* in the fleet of Commodore Perry. He arrived too late: the American squadron of 1853 had steamed out of the bay of Yeddo. While lying in Yeddo, suffering from disappointment, he learned of the Russian fleet at Nagasaki, and back again to his native island trudged he on foot. He was once more too late! After gaining a few scraps of knowledge by associating with the degraded Dutch interpreters, he wearily walked back to Yeddo. Soon after Commodore Perry made his visit of 1854. Our hero, with one companion, determined to go abroad, acquire knowledge, and then return and devote their acquisitions and their energies to their country. Their act was unprecedented; it was criminal; and it was to take them beyond the pale of humanity into a land of devils! They reached the fleet, and in the dark boarded one of the vessels. But the recent treaty compelled their return to the authorities on the next day. Such disappointments are too great for commentary. They suffered a long and miserable confinement, and the simple soldier Ichigi died while yet in prison. Yoshida, our hero, while a prisoner, was intensely active,—writing memorials to the government and tracts for the people, all advocating the importance of the new learning and the immediate necessity for it. These were contraband, but he made friends among the officials, and the dissemination progressed. The government changed him from one place of confinement to another, but this only hastened the spread of his ideas.

After serving out his term, he was turned over to his feudal lord to be treated as a feudal rebel. By the influence of his friends he was enabled to dwell in his own house, yet was under constant police surveillance. He now devoted his time to the education of youth and the keeping up of communication with a few reformers. The last act of his brief life was at hand. Some of his work was done, for the Dutch teachers

had been admitted into Nagasaki and the country at large was keen for the new learning. Though the new order of thought had commenced, yet it was impeded and dangerously threatened by the power of the Shogunate. The ministry *discouraged* students from going to Nagasaki, and by spies, espionage, imprisonment, and death the ranks of the innovators were thinned. Yoshida endeavored to accomplish the death of the head of the ministry. He was suspected, seized, imprisoned, and executed. Though he failed in each particular enterprise, yet his friends and his pupils became leaders in the revolution; they are now men high in power and usefulness; they are the foremost in the acquisition of the knowledge and culture of the West.

Prior to the introduction of Western knowledge through Nagasaki and the Dutch, the *Chinese school* was the only acknowledged medical practice in this land, and at the present time it is the most extensive form of practice in the interior. This form of medical instruction and practice has not now the official sanction of the government, yet its precepts and influences are so deeply seated in the minds of the people and the court ladies that the heir-apparent, Prince Haru-no-Miya, and his mother were placed in the care of the most celebrated practitioners of the Chinese school last year. At present there is in Tokio a society of this school, who meet twice a week for consultation and conference. They instruct students and furnish them with proper certificates. Such practitioners, throughout the country, educate in their families, by precept and example, young men to succeed them and to propagate their ideas and methods.

The Dutch during their trade at Decima introduced to the knowledge of the Japanese many drugs and medicines and supplied them with books and instruments. When Commodore Perry visited this Land of the Rising Sun, the gifts of books on medical topics were most highly prized and most persistently sought after. Thus were the germs of the medical knowledge of the West implanted in this land.

Four years after the treaty of Kanagawa with Commodore Perry, Messrs. Ito and Totsuka, who had acquired from the Dutch a little knowledge of medicine, requested the Tokugawa government (Tycoon-ate or Shogun-ate) to establish a vaccination

house, and thus to prevent an increase in the prevalent epidemic. In answer to this the Shu-to-kan, or vaccination house, was opened at Yeddo. At this time there were only eight gentlemen in the empire who possessed even a rudimentary acquaintance with modern medical science. These gentlemen collected 580 yen, and, aided by the government, the following year erected a new and enlarged office. At this institution, as a nucleus, gathered the men interested in medical advance. In 1862 a department for instruction was combined with that of out-door relief, and in that year the "Seiyo-I-Gakku-Jo" (Western medical instruction house) was acknowledged and aided by the government. The leaders in this movement, Oki, Ogata, Sagara, had been instructed at Nagasaki and Osaka. Their knowledge and their ability soon attracted to Yeddo more students than could be accommodated. Matsumoto, a student of repute and ability, was sent at government expense to pursue his studies under the Dutch, and upon his return to Yeddo he became president of the school. At Nagasaki, in 1861, was established the first hospital in Japan.

Before the war of the restoration Nagasaki was the medical centre of Dai Nippon. Here labored the men from Holland—Siebold, Bodwine, and others—in the employ of the daimio of Hizen. To this city flocked the students from all parts of the southern section of the empire. Instruction was given, in Dutch, in geography and natural philosophy in a two years' course by the interpreters. After this preliminary training they were advanced to instruction under the Dutch physicians. Anatomy was taught by lectures, books, diagrams, and canine, with occasional monkey, dissections before the class. Human material was not to be had, or only rarely and secretly, on account of the deep-seated prejudices and superstitions of the people. Necropsies were extremely rare. Few only of the students ever used the dissecting-knife. Very much time and effort was devoted to materia medica and to the application of drugs. Instruction in medicine and surgery was almost entirely clinical, as very few of the students could read Dutch fluently and understandingly. Connected with the school was a hospital of one hundred beds, under the exclusive charge of the foreign physicians. Twenty students each day followed

the professor in his visit. The advanced students resided in the hospital or became clinical assistants and attendants in the out-patient department. This course was designed to occupy six years. Most of the students remained only a short time, acquired a smattering, and then rushed off to all parts of the realm to put their little knowledge into immediate use. None were regularly graduated. Less than a dozen took an approximately full course. Among the latter are numbered the leading medical men of Tokio and Kioto of the present day. From the Nagasaki school have proceeded influences most powerful and penetrating for advancement throughout the length of this island empire. Stimulated by the example in the South, Dutch physicians were invited to Osaka and Tokio, where kindred medical centres were soon established. In 1870 a Dutch medical school was opened in Osaka.

The war of the Restoration demonstrated the urgent need of educated and skilful medical men for the military, naval, and civil services. The Mikado's government, at the end of the struggle, had upon its hands large numbers of sick and wounded. It had no hospitals, no medical stores, no organized medical service, no corps of educated medical men. Hospitals were established at the large sea-ports. Medical students, of even rudimentary acquirements, were pressed into the service to do surgeon's duty. Then was demonstrated the great value of the training of the Nagasaki school.

In 1867 there was erected at Tokio a large hospital for the army and navy, called Dai Biyo-in. Its management was placed in the hands of Dr. Willis, of England. It was not only a hospital, but became a school for clinical instruction. In 1869 this was combined with the "Seiyo-I-Gakku-Jo" under the name of "Dai-Gakku-Toko," with Messrs. Iwara and Sagara (educated at Nagasaki) as the chief physicians. During 1871, Drs. Hoffmann and Miller, under government contracts, came from Germany to assume charge of the Tokio hospitals, and to organize a medical college after the most approved modern methods. In the same year twelve of the most promising of the young medical men of the country were selected to proceed to Germany, and there to pursue a full and thorough course of study at the government expense. The following year

a course of study—preparatory and advanced—was elaborated, and subsequently accepted and adopted by the government. It was determined that the language of the medical school should be German. German gentlemen were engaged, and the work of the preparatory department was entered upon at once. In the succeeding year the corps of instructors was increased by the arrival from Germany of the professors of therapeutics, of chemistry and physics, of natural history, and of languages (German, Latin, and Greek).

During 1875, Drs. Miller and Hoffmann returned to Europe, and their places were filled by Drs. Schultze and Laanggaard. In this year the college was removed to its present locality in Kaga Yashiki (the Yeddo residence of the daimio of Kaga). In October of this year the foreign departments of the Nagasaki and Osaka schools were removed to the "I-Gakku" at Tokio. In 1876 a new department of the Tokio school was established. It is designed to give instruction in foreign medicine through the Japanese language to a large and increasing body of students, who have not the time or the means to pursue the full course of the "I-Gakku." In this department sixty students are to receive free instruction annually, and the others will be required to pay a small monthly fee. 1877 will be memorable in the history of medical instruction in Japan, as the year in which the new college, the large foreign-modelled hospital, and the drug laboratory were opened for instruction. 1878 witnessed the last feature of general organization,—that of the transference of the medical department from the home department to the mombu-sho (educational department), under the title of "Dai Gakku-I-Gakku-Bu."

J. C. CUTTER.

PROCEEDINGS OF SOCIETIES.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

A CONVERSATIONAL meeting of the Philadelphia County Medical Society was held at the hall of the College of Physicians, Philadelphia, June 9, 1880, Dr. John H. Packard, Vice-President of the Society, in the chair.

Dr. John B. Roberts presented an interesting specimen of a hairy cornea obtained from a calf. (See page 548.)

HYDROPHOBIA.

The discussion upon the pathology of hydrophobia, postponed from the last meeting, was opened by Dr. Chas. K. Mills, who by request repeated the main points contained in his paper read before the Society. He denied (1st) that hydrophobia is due to a special morbid virus; (2d) that it is accompanied by specific changes in the blood; or (3d) that it has any absolutely characteristic lesions in the central nervous system. He regarded the origin of the chief symptoms in most cases as capable of being explained on the view of peripheral nerve-irritation, set up originally in the wound, and transferred by reflex action to the medulla oblongata. Many cases called hydrophobic were also examples of recognizable and demonstrable disease of an entirely different character. Some cases resulted from fear or imagination.

Dr. Chas. B. Nancrede said that he had, with Drs. Cleemann and Geo. Rex, witnessed a fatal case of hydrophobia in a healthy child, and could not accept Dr. Mills's theory that the disease is entirely due to peripheral irritation and is not dependent upon a specific virus. This ancient doctrine has been disputed before, but lately one of the leading heretics has recanted, and now acknowledges the truth of the former view, that a poison is actually transmitted, to which the subsequent symptoms are attributable. The first difficulty in accepting the prevailing opinion is that so many persons are bitten who never get the disease: but a little reflection will dispose of this objection. To begin with, the dogs are not always mad that do the biting. Veterinary surgeons tell us that it is very difficult to decide whether or not a dog is actually hydrophobic. The avoidance of water is rare, convulsions are rarer, and strange behavior, wandering from home, and other well-known symptoms may be caused by tape-worm, which produces a disorder which simulates hydrophobia very closely. Clearly, those who are bitten by the latter will not have hydrophobia; and it has been said that out of thirteen hundred to fourteen hundred reported cases of supposed hydrophobia, only one in twenty-five ($\frac{1}{25}$) had the disease. Moreover, of persons bitten by the truly rabid dogs, not more than fifty per cent. will have hydrophobia, for all persons are not equally susceptible. Only from two-thirds to two-fifths of the cases of inoculation are successful in dogs, while in some instances they resist once, twice, or three times, and then succumb. In these cases there is the peripheral irritation of the bite, but no hydrophobia until the inoculation is successful. When a dog bites several persons in succession the danger decreases each time, for the virus becomes wiped off; and in just the same manner the wounds of the parts covered by clothing are less dangerous than bites upon the face or hands. The risk is also decreased, as experience has taught, where the wound is

large and is followed by free bleeding; although in this case there must be more peripheral irritation than in the apparently trifling wounds that often cause hydrophobia.

In regard to the question of the ability of healthy dogs to communicate the disease, the speaker was surprised that Mr. Fleming had apparently supported this view. This error had been caused by the fact that hydrophobia has sometimes a long period of incubation, lasting eight months or even longer; but during this period the dog's bite is poisonous, and out of nineteen cases reported which were bitten during this incubation stage, eighteen were fatal.

There is no peripheral irritation apparent in these wounds; on the contrary, they readily heal; it is difficult to keep them open. There is a case on record where a veterinary student with a wounded finger made a post-mortem examination of a dog which had died the day before. Some months afterwards he died within twenty-four hours with all the symptoms of hydrophobia. Here is all the evidence of systemic infection by a specific poison; moreover, it has been proved that the saliva of a man suffering from the disease can give hydrophobia to a dog.

The speaker was unable to see how it could be due to peripheral irritation, for in those cases where the peripheral irritation is greatly increased by the application of the hot iron or caustic potassa the danger is decreased, for out of one hundred and thirty-four persons whose bites were cauterized promptly only thirty-three per cent. died, while of those in whom cauterization was neglected eighty-four per cent. died. Even delayed cauterization has been found useful in animals.

In the quality of lying dormant for a certain period hydrophobia does not stand alone. Syphilis is at first a purely local manifestation, but after a variable length of time it presents evidences of having contaminated the system. In the vast majority of cases the period of incubation of hydrophobia is about six weeks.

It is impossible to assume that hydrophobia is caused by fear or due solely to imagination, for out of three hundred and nineteen cases collected in France nine per cent. were under five years of age, where imagination could not be the cause. In the adult such may occur exceptionally, and even prove fatal from congestion of the brain; but it would be difficult to believe that many such cases occur. A large proportion of those bitten upon the face die, perhaps not so much because of its being the area of distribution of the fifth nerve as from the fact of its being an exposed portion of the body. In the analogous disease, rabies mephitis, the skunk invariably bites some part of the face, and unless treated the resulting disease is certainly fatal.

That other disorders have similar lesions in the medulla oblongata may be accepted without denying the specific character of the

poison of hydrophobia. In the diseases mentioned by Dr. Mills as presenting similar lesions, the same centres—i.e., *those of respiration and deglutition—are involved, and may consequently show similar lesions from similar convulsive disorders.* Syphilis and alcohol may cause similar lesions in the liver, but no one would contend that they are the same. Moreover, these other disorders are not invariably fatal, as is hydrophobia.

The importance of a correct understanding of the method of communicating hydrophobia is apparent in considering treatment.

In the so-called tetanus hydrophobica, which more closely simulates the true disease than any other, according to Rose the wound is *always* facial, while in the genuine disease it may be situated upon any portion of the body.

If there is a specific virus the wound should be cauterized, to destroy it and convert it into a simple wound.

There is a popular fallacy that where dogs are allowed to run at large—in India and in Turkey—there is no hydrophobia. This has been denied by good authority. Wherever there are dogs hydrophobia may occur. Dr. Nancrede also spoke of the occurrence of hydrophobia in many other animals whence the disease might arise, as well as the possibility of a slight abrasion upon the hand becoming inoculated unawares.

Dr. M. O'Hara mentioned a case of disease of the brain which had at one time hydrophobic symptoms. A case of general paralysis, after the ordinary symptoms of delirium of grandeur, stupor, etc., presented all the phenomena apparently of rabies. Very little was found at the post-mortem examination to account for the symptoms. He considered the theory of peripheral irritation as a very interesting one, and hoped that more light would be thrown upon it.

Dr. Nancrede remarked that it is well known that many cases of brain-disease present analogous symptoms, but none of them can communicate hydrophobia.

Dr. Richard A. Cleemann said that it is impossible to determine whether the lesions found after death are the primary effects of the poison, or the secondary nerve-lesions resulting from the convulsions. Nor can we at present declare the path taken by the poison. One thing which is strongly in favor of there being a specific virus is the fact that where the clothing covers the place bitten there is much less danger of hydrophobia, while at the same time the dog's teeth are more likely to inflict a jagged wound, which would cause more peripheral irritation. Nor can we always suppose fright, for in the case he had seen with Dr. Nancrede the wound was so small as to cause no alarm or excitement upon the part of the little patient or his mother. There is undoubtedly in hydrophobia extreme reflex irritability. In the case just

referred to, merely attracting his attention was sufficient to produce the reflex action of the respiratory muscles.

Dr. R. Burns, of Frankford, was much interested in the subject and in the discussion. He was called to see a gentleman about forty-five years of age, who had a favorite dog, which had bitten him. The servant had refused to feed the dog because he thought something was the matter with the animal; the gentleman took the food to the dog, which snapped at his master's hand. The wound was not deep, but at the solicitation of those around him the gentleman came to the speaker's office, and the slight superficial wound was cauterized with nitric acid within three or four hours after the injury had been inflicted. The wound was clean, not ragged, and only passed through the integument. Some days after, the speaker was called to see the patient. The finger had healed up nicely, there was no irritation about it, and no complaint was made of it. The man was kept under observation, and it was noticed that his temperament passed through a change; he became more and more despondent and dejected; he became emaciated, his features were contracted, and he looked sick. This was spoken of by his friends, but he would not acknowledge it himself. About the ninth day after the accident he became delirious, had delusions, and was at times furious. There was such an intolerable secretion from the mouth, nose, and eyes, and he also exhaled such a peculiar odor from his body, as to lead to the opinion that some infectious disease or poison had been introduced into his blood. His whole room, including the floor and wall as well as the bed, was covered with a tenacious saliva tinged with blood, which he constantly expectorated. His flesh looked as if in a state of morbid solution, and he shortly afterwards died. Not long afterwards a farmer, who had a horse bitten by a mad dog, had an abrasion upon his hand inoculated while attending to the animal, which died of hydrophobia. The farmer afterwards died of hydrophobia, as did also some pigs which had been bitten by the same dog.

Dr. J. L. Ludlow believed that it was possible that there might be not only a specific virus but also peripheral irritation induced by the poison. Many cases die of fright. In all cases suspected to be hydrophobia we want more definite histories. He recalled a case where a woman was bitten by a pet dog; she was very nervous. He arrived just in time to prevent the husband from killing the dog, which remained under observation for a long while in perfect health. He also mentioned a case occurring at the Presbyterian Hospital about four years ago, where a man presented hydrophobic symptoms as a result of sunstroke. He completely recovered under ergot and bromide.

Dr. John B. Roberts had seen two fatal cases

of hydrophobia in which no history of dog-bite could be obtained.

Dr. Packard desired to call attention to two or three points which, it seemed to him, had been not enough dwelt upon, if at all, in the discussion.

1. He would ask whether these were not established facts: that a certain chain of symptoms, of which Dr. Collins's case afforded a good illustration, and which constituted the disease known as "hydrophobia," was in many cases clearly traceable to the bite of a dog; that such dog was always affected with "rabies canina;" that such disease was always markedly distinct from tetanus or any other form of nervous disorder; and that not one case of recovery, after the development of the symptoms of hydrophobia, was on record.

2. Many of the cases of this peculiar disease have occurred in children who had never heard of hydrophobia, and in persons who had totally forgotten the fact that they had been bitten; some of them in persons who did not believe there was any such disease as hydrophobia. If it were a purely nervous affection it might occur from fright; but no such instance is known.

3. Facts upon record show that this disease is much less apt to follow bites inflicted upon portions of the skin protected by clothing, in which the teeth of the animal would be more or less wiped clean before puncturing the skin; and this, as well as some of the other features of the disorder, was in favor of the theory of a specific virus.

4. It is not possible to draw any analogy between this disease and the effects, for example, of rattlesnake-bites, since in the latter case the symptoms come on immediately, without the period of incubation always observed between the bite of the dog and the development of hydrophobia. Then, the rattlesnake is provided with a special apparatus,—a duct leading from the poison-gland to the tip or near the tip of the fang, and the gland or sac being compressed by the muscles closing the jaws so as, in the act of biting, to effect a hypodermic injection, as it were, of the venom.

Dr. Ludlow said that the peculiar symptoms of hydrophobia are principally those belonging to the nervous system, and similar appearances occur in other diseases. He cited a case of uterine disease that barked like a dog and had numerous convulsions, which was entirely cured by two intra-uterine applications of iodine and forced dilatation.

Dr. Nancrede said that nearly half of the cases bitten by rabid dogs die of undoubted hydrophobia, while similar wounds produced in other ways never cause hydrophobia.

Dr. W. R. D. Blackwood had seen both hydrophobia and tetanus, and recognized a distinct difference between them. He mentioned the case of a man whose hand was

covered with the saliva from a mad dog when trying to separate two dogs which were fighting. His hand was not bitten, but he had his nails cut close, and there must have been absorption, for he died with hydrophobia. It seems evident that there must have been a virus. There was no peripheral irritation from the bite, because there was no bite. This view, that there is a virus, is also supported by another case that he saw while in camp. A rabid dog came into camp one day and bit two other dogs and a woman before he was killed. One of the dogs was bitten after the woman had been bitten. The speaker sent for a bottle of nitric acid and let it run over the wound on the woman's hand shortly after the accident. This set up a good deal of peripheral irritation, but she did not have hydrophobia, although both of the dogs did within seven weeks after the affair occurred. This was seven years ago, and the woman is still living.

Dr. Cleemann, in reference to a preceding speaker, said that in the case he had seen there had been no barking, and he thought that this was a popular notion that had been exploded. So far as he was aware, there was nothing in hydrophobia in man that is at all comparable to either barking or snapping.

Dr. M. O'Hara referred to another case of pseudo-hydrophobia in an old man sixty years of age, who called upon him a year ago to attend him during his closing hours, as he said that he knew he had hydrophobia. He had been bitten three weeks before on the hand. The wound was red and irritated, but there was no use in applying nitric acid. The man had anxiety, terror, and the premonitory symptoms of hydrophobia. In the course of ten days they all disappeared. There had been no expectoration and no convulsions, but there was fright and plenty of peripheral irritation.

Dr. William W. Welch recalled a case where hydrophobia was caused by the licking of the face by a pet dog; there was no wound, but merely absorption from a broad surface.

Dr. James Collins said that when chloroform first came into use it was hailed as a remedy for almost everything, and he remembered having heard a story of Professor Samuel Jackson, in one of his clinical lectures, reporting a case of hydrophobia cured by it in Camden. An old gentleman with a peculiar voice inquired, "Sam, did she bark like a dog?" "Yes," said Dr. Jackson. "Then she will have it again," said Dr. Chapman, as he stalked out of the room.

From the speaker's experience he could say that barking like a dog is not a symptom of hydrophobia, except in simulative cases. In the case reported it was not present. The woman certainly was not afraid of hydrophobia, and would scarcely believe that her sickness was attributable to the dog-bite. He had seen a case of tetanus a few weeks be-

fore, and considered it a distinct disease. In tetanus there is not the same restlessness that is seen in hydrophobia, where the patient walks up and down the room like a tiger in his cage.

Dr. Frank Woodbury said that since hydrophobia is known to arise spontaneously in dogs* it is possible that it may also originate spontaneously in man.† This is the only explanation of those cases in which true hydrophobia appears without proof of inoculation, unless we are prepared to assume that the evidence is always defective.

Dr. Mills, in closing the debate, said that some of the arguments advanced against his stand-points he believed were already sufficiently answered in his first remarks upon the nature of hydrophobia, and he did not wish to take up the time of the Society by repeating himself at too great length. In the haste of debate he might also pass unintentionally some of the points presented by the speakers. Notwithstanding the numerous and forcible arguments put forward during the evening, he still did not see sufficient reason to recede from the ground which he had taken, namely, that the cases called hydrophobic could probably all be accounted for by the view that the symptoms manifested were the result of peripheral nerve-irritation, of localized cerebral or spinal disease, or of psychological conditions.

Dr. Nancrede says that of those bitten by truly rabid dogs fifty per cent. have hydrophobia; but statistics in regard to this point are very conflicting, the percentages of different observers varying all the way from five to fifty. The resistance to inoculation, as has already been indicated, is as much an argument one way as the other: repeated attempts at inoculation mean repeated woundings of the animal. Why peripheral irritation in one case produces hydrophobia, and in another does not, I am not altogether prepared to say. The same thing, however, is observed with reference to traumatic tetanus and epilepsy. The character and position of the wounds, and the condition of the patient's system, probably have much to do with the result. He would again call attention to the fact that dogs supposed to be healthy so frequently have caused the reported cases of hydrophobia, which would seem to be strongly against the idea of a specific virus. According to this view, to cause hydrophobia the animal should always be mad. To say that dogs apparently healthy might be in the incubation stage of hydrophobia was at the best a mere assertion, wanting solid proof. In regard to the amount of evident peripheral irritation, he did not agree with Dr. Nancrede that the wounds were rarely

irritable. Reports differ. In one of the cases being discussed the recognizable irritation was very great; in the other none was present. The fact that the face is less protected than other parts of the body may have something to do with the greater frequency of the occurrence of hydrophobia after bites in this region, but another reason, more in accordance with the peripheral irritation hypothesis, has been given. The fifth nerve has its distribution upon the face, and it has its nuclei and fibres of origin in the medulla oblongata and pons, in close proximity to those of the pneumogastric, hypoglossal, and other nerves concerned in hydrophobic manifestations; so that peripheral irritation of the fifth nerve would be more likely to be followed by hydrophobic symptoms than that of other parts of the body. The single observation mentioned where hydrophobia seemed to have been communicated to a student making a post-mortem examination on a rabid dog has not much weight. Much opposing evidence is on record. At Alfort, for instance, students having wounds have often held autopsies on rabid animals without any bad effects following. The published observations in regard to retro-inoculation from men to animals were not to the speaker very convincing; some experimenters had failed entirely. It is not necessary to believe, he would again remark, that cauterization, and like procedures, are beneficial because they destroy a virus; such measures may act in other ways,—as nerve-stretching in tetanus, as cutting out a scar in reflex epilepsy, etc. Large wounds, strong caustic applications, and the like, for some reason not clearly known, are less apt to cause tetanus, epilepsy, or hydrophobia. Molecular irritability in a nerve is as likely to be set up by a small as by a large wound. It is true that the smallest wound might allow the entrance of a virus; but the smallest wound might also give rise to such irritation as to lead to tetanus, epilepsy, or hydrophobia. The fact that hydrophobic symptoms occur in children with such frequency after dog-bites may be largely due to the greater impressionability of the nervous centres in the young than in adults. That other disorders have similar central lesions to those found in the hydrophobic cases may not prove anything positively with reference to the specific character of hydrophobia, but calling attention to this fact serves to indicate the great liability to mistaken conclusions.

A strong common-sense argument is that advanced by one of the speakers, who wishes to know if in any other disease we have the same chain of symptoms as in hydrophobia. In the second case referred to in the paper, post-mortem examination showed chronic lesions, such as are found in pachymeningitis and other chronic alterations in the cerebro-spinal tract. The changes may have been secondary or may have caused the symptoms.

* Fleming, *Veterinary Journal*, London, 1878. See also Dr. Kane's narrative of Arctic Voyages.

† Case reported by M. Guillery, *Bulletin of Belgian Academy*, No. 8, 1871, *La Tribune Médicale*, January 21, 1872.

In a case of diffused sclerosis, long under observation at the Philadelphia Hospital, the patient was suddenly seized with convulsions, in which he died. The spasms involved terribly the muscles of deglutition and respiration. Cases of localized tubercular meningitis, and in fact any lesions affecting certain parts of the pons and medulla oblongata, may give rise to hydrophobic symptoms. How were Dr. Roberts's two fatal cases of hydrophobia, without the history of dog-bite, to be explained on the blood-poison hypothesis? Cases of hydrophobic tetanus had been referred to in the general remarks. Hydrophobic symptoms, so called, occurred independently of the bites of animals much oftener than most physicians supposed. Kirchoff (*Berl. Klin. Wochens.*, No. 25, 1879) reports the case of a woman who fell with her face into some briars and died of hydrophobic and tetanic symptoms.

Dr. Henry Leffmann then read a

NOTE ON BISMUTH SUBNITRATE. (See p. 547.)

On motion, the thanks of the Society were tendered to the lecturers for their interesting remarks.

F. W.

PATHOLOGICAL SOCIETY OF PHILADELPHIA.

THURSDAY EVENING, JUNE 10, 1880.

The PRESIDENT, DR. S. W. GROSS, in the chair.

Specimens (supra-renal capsules, kidneys, and enlarged lumbar glands) from a case of Addison's disease. Presented by Dr. FREDERICK P. HENRY.

THE clinical history of this almost typical case of Addison's disease is very meagre in details, owing to the fact that I saw the patient, a female, æt. about 50, but once before her death. The facts obtained are, however, of considerable interest. The woman was admitted to the Episcopal Hospital on the afternoon of May 26, and died on the morning of May 28. While examining her on May 27 I was struck with the peculiar sallowness of her complexion, and asked her whether she had been as dark-colored when in health. She replied that her skin had darkened in color since her illness, which dated from August, 1879. The color could not by any stretch of imagination be compared to *bronze* of any kind, but rather resembled the hue of jaundice in slight amount occurring in a person of dark complexion. The patient was naturally a brunette. The conjunctivæ were natural in color, and although in describing the color of the skin I have spoken of jaundice, I entertained no suspicion of the presence of that affection. As is not infrequently the case in this remarkable disease, many cases of which are of traumatic origin, the patient was able to assign a definite period to the com-

mencement of her illness. The attack began in August, 1879, with weakness and pain in the back immediately following the occupation of weeding her garden. These local symptoms continued with greater or less intensity ever since, but the pain was latterly most severely felt in the left lumbar region, in which situation there was also a great degree of tenderness on pressure. About three months before admission she had had a violent attack of enteralgia lasting for several days, the pain being greatest in the hypogastric and right and left inguinal regions. The woman was thin as to the arms and thorax, but not at all emaciated, and the abdomen was full and round, with considerable fat in its walls. The tongue was slightly coated. She suffered from occasional vomiting, and the bowels were, as a rule, constipated. The abdomen was more or less tender throughout, the tenderness increasing as the left lumbar region was approached. There was some cough, and physical examination of the thorax revealed slight dulness at right apex before and behind, prolonged expiration, and increased vocal resonance. The act of sitting up in bed while the thorax was examined was followed by considerable exhaustion. The pulse was soft and compressible, though full. The general intelligence was good. Sleep was poor. The pupils were natural.

Examination of the urine served rather to mislead. It contained blood-corpuscles and uric acid crystals; the latter visible to the naked eye in the form of red-pepper grains, and under the microscope in the form of rosettes. These characters of the urine, taken in connection with the fixed pain in the side and the severe paroxysm of abdominal pain three months before, led to the conclusion that the case was one of nephrolithiasis.

On visiting the hospital on May 28 I was surprised to hear of the patient's death, as there was nothing in her condition the day before to indicate the near approach of a fatal termination. I may say in this connection that this sudden mode of death in Addison's disease is not infrequently met with, and is referred to by Wilks and Moxon,* as follows: "The process is chronic, and lasts often several years. The patients die generally slowly by asthenia, but some have gone off suddenly by rapid sinking and syncope." Greenhow refers to the manner of death in almost the same words, so that it is presumable that he was quoting from Wilks and Moxon, or *vice versa*. He says,† "Death takes place by asthenia, and sometimes, at the last, almost suddenly, apparently in syncope."

At the autopsy, quite a thick layer of fat was found in the connective tissue of the abdominal walls. The blood was fluid, and on removing the liver it poured out of the inferior

* Lectures on Path. Anat., Phila., 1875.

† Croonian Lectures on Addison's Disease.

vena cava in large amount. There was none of the dryness and translucency of tissue so constantly met with in severe cases of anæmia. In the mesentery of the small intestine, in the meso-colon, and in the gastro-hepatic omentum, a few miliary tubercles were found; also on the peritoneal surface of the first portion of the duodenum. The mesenteric glands were greatly, and the lumbar glands enormously, enlarged. Along the vertebræ these latter were firmly united by dense masses of connective tissue in which the solar plexus and semilunar ganglia must have been imbedded, for a careful and persevering attempt to dissect out these structures was unsuccessful. The degree of this overgrowth of connective tissue, in connection with the enlarged glands, may be estimated to some extent when it is mentioned that I found it impossible to remove the pancreas except in fragments. This being the case with regard to so prominent an organ, it is not to be wondered at that the semilunar ganglia and solar plexus could not be found. Both supra-renal capsules were greatly enlarged, and hardened. They were firmly adherent to the neighboring tissues through the medium of dense connective tissue, and were removed with much difficulty. There was no greater irregularity of their surfaces than could be attributed to ruptured adhesions. The centres of the capsules, particularly of the left, were paler in color and softer than the surrounding portions, which gradually shaded from a pale red about the slightly yellowish centre, to a deep red at the periphery. The naked-eye appearances were such as to indicate that the proper tissue of the organ had been replaced by a new growth of a fibroid structure. All distinction between cortical and medullary substance, and all trace of a central cavity, were obliterated. In order to show the comparative relations of size and situation, the capsules were not separated from the kidneys, and consequently there is no record of their weight. It is, therefore, difficult to convey an idea of their size. Both capsules retained their normal cocked-hat shape. The left, the larger, was closely adherent to the kidney, which was of normal size, and was estimated by those who saw it to be fully its equal in bulk. The right was looser in its attachment to the kidney and much smaller. It was calculated by one of the members of the Society, a member of the Committee on Morbid Growths, that the left capsule was twenty and the right five times larger than normal. The kidneys and spleen appeared normal. At the apex of the right lung was a slight degree of induration and some puckering of the surface. The induration was very superficial. Neither tubercle nor cavity was formed. Similar but still slighter changes were found in the left apex.

In the opening sentence of this paper I spoke of this case as being *almost* typical; and this expression needs some explanation.

By a typical case is meant one in which the sole naked-eye lesion is in the supra-renal capsules. In this sense, the case which I reported in vol. v. of the Pathological Society's Transactions is a typical one. It must be borne in mind, however, that there is overwhelming evidence to prove that although, in a typical case, the disease begins in the capsules, yet many of the symptoms, perhaps among them the peculiar discoloration of the skin, do not arise until the neighboring plexuses and ganglia of the sympathetic are involved in the inflammation. The changes in these organs are often only to be perceived with the aid of the microscope. Although in this definition of a typical case I follow the high authority of Greenhow, who has collected one hundred and one cases in which there existed no other organic lesion than that of the capsules "which could be of the slightest importance," nevertheless I think it is extremely doubtful whether the coexistence of tuberculosis in any degree should forbid the classification of a case under the head of typical. According to Wilks and Moxon, of fifteen cases exhibited at the London Pathological Society, twelve showed more or less tuberculous disease of the lungs; in two the lungs were not examined; and only in one case are they said to have been found healthy. The enlargement of the lymphatic glands cannot be regarded as a complication unless as regards its unusual degree, for Greenhow states that in "almost every case" he had seen there were some enlarged lymphatic glands in the "dense connective tissue surrounding the capsules." He also states that "the mesenteric and retroperitoneal glands in the neighborhood of the capsules are generally enlarged." Enlargement of the spleen has been reported in a number of genuine cases, but was not found by Greenhow in any of his own.

For proof that the melasma supra-renale originally described by Addison is dependent upon a uniform lesion, and for an exact description of that lesion, I refer the reader to Greenhow, both for the sake of brevity and in the hope that thereby some may be induced to read his admirable monograph upon Addison's disease.

As showing the rarity of this affection, I may refer to the fact that in the eight volumes of the Transactions of the Pathological Society of Philadelphia there is but one case recorded, and that was exhibited by me in 1874.

MEDICAL STUDENTS IN LONDON.—The following table gives the number of students at each of the London Medical Schools: St. Bartholomew's, 86; Guy's, 81; University College, 71; St. Thomas's, 35; London Hospital, 33; Charing Cross, 32; St. George's, 30; King's College, 26; St. Mary's, 24; Middlesex, 24; Westminster, 19; London Women's School, 9.

MISCELLANY.

THE present volume, just received, of "Wood's Library of Standard Medical Authors" consists of a reproduction of the third edition of Savage's well-known "Surgery, Surgical Pathology, and Surgical Anatomy of the Female Pelvic Organs." It contains thirty-two very well executed plates, besides twenty-two wood engravings.

OBITUARY.—In the recent death of Mr. S. Messenger Bradley, at the early age of 39, the medical profession of England has lost one of its prominent members and a man of uncommonly versatile talent. Mr. Bradley was perhaps best known in this country as the editor of the *Liverpool and Manchester Medical and Surgical Reports*, although known also as the author of a large number of works and papers on medical subjects, the latest of which, "On the Injuries and Diseases of the Lymphatic System," had only recently been published. He was a popular lecturer, and was also something of an artist, besides possessing social qualities of a high order.

THE death is announced of the veteran toxicologist, Alfred Swaine Taylor, M.D., F.R.S., whose name is indissolubly connected with the chief advances in modern jurisprudence. Dr. Taylor was a graduate of St. Andrew's, in Medicine, Fellow of the Royal College of Physicians, Member of the Royal College of Surgeons, and Licentiate of the Society of Apothecaries. He was also a Fellow of the Royal Society. At one time he occupied the chair of Medical Jurisprudence at Guy's Hospital. He is best known, however, and will long be familiar to the student through his matchless work on the "Principles and Practice of Medical Jurisprudence," and the hand-book on "Poisons," which forms part of every English medical student's library.

EFFECT OF PODOPHYLLIN ON THE SENSE OF TASTE.—A correspondent of the *Lancet* calls attention to the singular effect of podophyllin on the sense of taste when exhibited in small repeated doses. Patients have declared that they could not distinguish one food from another during the treatment. A gentleman who had taken it in doses of one-thirtieth grain three times daily found, after three doses had been taken, his tongue with the neighboring glands greatly swollen, profuse salivation, and entire loss of taste.

NOTES AND QUERIES.

PARIS, July 2, 1880.

TO THE EDITOR OF THE *Philadelphia Medical Times*:

SIR,—I received, a few days ago, the *Philadelphia Record* of June 11. The first page of this paper was almost wholly occupied with an article entitled "Another Doctor-Mill Exposed." The subject is one which will, I think, bear some remarks. In the first place, I believe there are very few places in the world outside of the United States where such a state of things would be possible. I doubt if there is another such place where degrees are obtained with such ease

as with us. And I doubt still more whether there is another place where institutions for granting degrees can so readily obtain charters. The *Record* states, "Our good city was covered with disgrace;" and it might just as truly have said that every Philadelphia graduate was likewise covered with disgrace. Having studied in London, I have often been asked where I came from; I answered Philadelphia, and I remember to have been told, more than once, that that was where degrees could be bought and sold. Sometimes I was asked whether we had any good colleges there. Some of the men knew of others who had degrees from Philadelphia, but the possessors of those degrees had never been to America. I had not thought that the operations of these *lawfully-chartered* institutions were so well known abroad, but I found, alas! to my cost that they were. The granting of charters seems to be a little more serious thing abroad than it does at home. In Great Britain the thing can only be done, I believe, by an Act of Parliament. Contrast that with the granting of a charter for a medical college by a *Judge of the Court of Common Pleas*. Imagine a diploma from such a source giving the right to practise almost anywhere in the United States.—I say almost, because I have heard that there are some States who have the courage to accept no examinations but their own. The chartering of a special college for the teaching of electricity seems also, to me, to be based on erroneous grounds. Was it thought that the study of medical electricity had been so neglected in our regular schools that it was necessary to inaugurate a separate college for its proper teaching? To my mind, it would seem as reasonable to establish a college for the sole purpose of teaching the proper method of administering calomel. They are both therapeutic agents, and both receive their proper attention in the regular medical course. There is no necessity for establishing separate institutions for their especial benefit.

The remedy for these evils can only be obtained, I believe, by State legislation. As long as a city has the power to set afloat such institutions as our city has heretofore distinguished itself with, so long will reform be impossible. Instead of students being examined by their own teachers, who are naturally averse to rejecting them, it would be better to have a State examining board who would examine in succession at the different educational institutions. This uniformity of examinations having been secured, the requirements could be made more high. The examinations should also be held in public, as they are in France. This would give additional security. Everybody admitting that there already exist far more medical colleges than there is any necessity for, any further granting of charters should be prohibited.

G. G. D.

OFFICIAL LIST

OF CHANGES OF STATIONS AND DUTIES OF OFFICERS OF THE MEDICAL DEPARTMENT U.S. ARMY FROM JULY 16 TO JULY 24, 1880.

SIMONS, J., LIEUTENANT-COLONEL AND SURGEON.—Granted leave of absence for one month. S. O. 118, Department of the East, July 15, 1880.

GREENLEAF, C. R., MAJOR AND SURGEON.—Granted leave of absence for four months. S. O. 158, A. G. O., July 20, 1880.

WINNE, C. K., CAPTAIN AND ASSISTANT-SURGEON.—Assigned to temporary duty at Fort Brady, Mich. S. O. 116, Department of the East, July 12, 1880.

MOSELEY, E. B., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for twenty days. S. O. 66, Department of the Platte, July 17, 1880.

PRICE, C. E., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for two months, with permission to apply for two months' extension. S. O. 154, A. G. O., July 15, 1880.

COMEGYS, E. T., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for one month on Surgeon's certificate of disability, with permission to go beyond the limits of the Department. S. O. 135, Department of Texas, July 8, 1880.

GIBSON, R. J., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—Having reported at these Headquarters, ordered to report to the Commanding Officer, Fort Leavenworth, Kansas, for temporary duty. S. O. 155, Department of the Missouri, July 19, 1880.

TAYLOR, A. W., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—Having reported at these Headquarters, is assigned to temporary duty at Fort Supply, Ind. T. S. O. 155, c. s., Department of the Missouri.